

Performance management and measurement concepts for better management control in public hospitals?

A study of the hospital sector in Norway

Kari Nyland, SINTEF Unimed Health Services Research
Inger Johanne Pettersen, Bodø Graduate School of Business

HEALTH ORGANIZATION RESEARCH NORWAY - HORN

Working paper 2004 : 5



UNIVERSITY OF OSLO
Department of Health Management
and Health Economics



Performance management and measurement— concepts for better management control in public hospitals?

A study of the hospital sector in Norway¹

June 2004

Kari Nyland, SINTEF Unimed Health Services Research
7465 Trondheim, Norway
e-mail: Kari.Nyland@sintef.no

and

Inger Johanne Pettersen, Bodø Graduate School of Business,
8049 Bodø, Norway
e-mail: Inger.Johanne.Pettersen@hibo.no

¹ The authors are grateful for the financial support from the Norwegian Research Council programme Health Organisational Research Norway.

An earlier version of the paper was presented to the European Accounting Association's 27th Annual Congress, Prague, Czech Republic, 1–3 April 2004.

Performance management and measurement— concepts for better management control in public hospitals?

A study of the hospital sector in Norway

Abstract

This paper investigates the link between performance measures and decision-making processes in the Norwegian hospital sector. The research findings are expected to add knowledge to the implementation of performance measurements and management systems in this context. The implementation of performance-based management systems acts as an element of reform that is similar to the New Public Management reform wave affecting the hospital sector internationally.

The empirical study is based on surveys at the national level, structured interviews in a large university hospital department, and statistics gathered from the accounting system at the clinical department level. A major conclusion is that the standard unit cost per patient, which is important benchmarking data, does not give relevant information for decisions in the hospital. Furthermore, the crudeness in the input and output measures hampers the implementation of performance management in health care institutions.

Key words: Hospital sector; Performance measurements; Performance management; Benchmarking data; Strategic and operational decisions

1. Introduction

The worldwide public sector reform processes, often called the New Public Management Reforms (NPM), have implied a wide range of changes in many different areas of service. One important element in these reforms is the introduction of private sector management techniques. In the hospital sector, these techniques are accompanied by performance audit schemes and a more explicit demand from the hospital owner (the state) to implement evaluation programmes to assess efficiency and effectiveness. The use of accounting information is a central part in these reforms. Consequently, *performance measures* are key words in this respect.

Against this background, this paper investigates the use of performance measures in the management control and decision-making processes in the Norwegian hospital sector. The focus is put on the application of performance measures and the use of economic measures as parts of the management control processes. The development of private sector styles of management practice, which imply a move towards explicit and formal measurable standards and measures of performance, will be the main topic in the discussion. These changes in management practices presuppose performance measures and the basing of resources and pay on actual performance. Taken together, these changes imply a more specific focus on measuring input and performance. Thus, the research issue is whether the performance measures give relevant information for decision making.

In this paper, the theoretical framework is first outlined and the empirical study described. These sections are followed by a discussion of the findings, with some preliminary conclusions.

2. The theoretical framework

The theoretical perspective of the paper is based on both normative and descriptive frameworks. In normative literature on management control, the link between plans and actions is not questioned. However, within the more descriptive works, concepts such as decoupling and ambiguity are used to understand the control tasks in complex organisations such as public hospitals.

2.1 Hospitals as complex organisations: the role of accounting

Hospitals are complex organisations. In this respect, Meyer and Scott (1992: 101-102) have pointed to the strength of medical professionals' autonomy and the strong professional structures and dominance of professionals in hospitals. This situation implies decoupling of the core activities—i.e., the performance of the health care professionals from the administrative hierarchy in the hospitals. The organisational solutions to these situations have been conceptualised by Weick (1976) as loose couplings and were found to exist in an empirical study of the link between budgets, accounting information, and decision-making processes at strategic and operational levels in a large hospital in Norway (Nyland and Pettersen, 2004).

The decoupling of health care delivery processes from the formal, administrative structures such as accounting practices may be observed as the decoupling of plans from action. In such inconsistent environments that characterise the contexts of hospitals, the budgets may serve the function of maintaining legitimacy, as the budget frames are constructed by the politicians and disconnected from the actual expenditures and activities of the hospitals (Brunsson, 1989; Pettersen, 1995). These observations also apply to the two different rationalities in such organisations. The clinical world follows the logic of appropriateness, whereas the administrative world's decisions are based on the logic of consequentiality (March and Olsen, 1976). Thus, health care delivery is buffered from accounting structures. When accounting information does penetrate into the core activities of the hospitals (the health care delivery processes), the information may induce unintended action visualised as symbols, rituals, and hypocritical behaviour (Brunsson, 1989; Nyland and Pettersen, 2004).

Conventional accounting information with a normative perspective is more in line with the aims of traditional production organisation efficiency than with the multiple objectives and complexity of loosely coupled organisations such as large hospitals. In these organisations the measuring of output and efficiency is more complicated. There are few (if any) value measures of the services provided and no profit measurement of public services, mainly because the budget allocations do not mirror the quality of health care activities.

Several studies have pointed to the ineffectiveness of costing and management accounting information in hospitals (Perrin, 1988; Preston et al., 1992; Lapsley, 1996; Jones and Dewing,

1997). In particular, the focus has been on the inability of the accounting systems to match the relevant information needs of key decision makers in hospital resource allocations (Lapsley, 1996; Jones and Dewing, 1997). Therefore, there is a demand for accounting information to contribute to making hospital organisations transparent and easily accessible for external evaluation.

Consequently, the concept of accounting has become more visible in the hospitals. This trend has been called accountingization. According to Hood (1995:93), “accountingization means the introduction of ever more explicit cost categorization into areas where costs were previously aggregated, pooled or undefined”. Kurunmäki et al. (2003) use this concept as described by Power and Laughlin (1992:132-133) to illustrate the influence of financial measures and how they impinge on core values in organisations. This instrumental perspective on accounting is an alternative to the concept of legitimation based on a more social constructivist perspective. The instrumental perspective has been developed as it was observed that in loosely-coupled organisations, accounting rules and other formal procedures may be of less importance instrumentally than in private sector production organisations (Meyer and Rowan, 1977; Lapsley, 1994).

However, the role of management accounting in hospitals can play both a legitimating role and an instrumental role. In their study of the use of accounting information in intensive care units in Finland and the UK, Kurunmäki et al. (2003) found that management accounting was absorbed by health care professionals in the Finnish setting, while in the UK the accounting expertise was deployed as a defensive shield by health care professionals:

The differing social and institutional contexts of management accounting practice shape its role as accountingization (“clinician-management-accountants”) or legitimating (“the accountant as historian”) (2003:136).

The emergence of management accounting practices as accountingization shifts the emphasis from input and process accountability elements to accountability in terms of results.

Accounting then becomes a central part in a new conception of accountability, with high trust in market transactions and private sector business methods, low trust in public sector administrative traditions, and a strong belief in the concept of economic rationality. The consequences of this shift in the conception of accountability in public sector management can be summarised as follows:

- The shift in emphasis from hierarchies to more competitive bases for providing public resources to hospitals
- The move away from fixed to variable pay
- The change from uniform public services to an emphasis on contract provisions

All of these trends have created an increased trust in accounting information as a set of tools for decision making.

2.2 Management accounting and benchmarking

Along with the move to the new concept of accountability, there has also been a search for mechanisms to develop more transparency in public services. This process has been central to the introduction of benchmarking initiatives. In the public sector, the idea of benchmarking is that this systematic gathering of quantitative data may give evidence of efficiency and of quality in the delivered services. In the UK, the series of financial management reforms in hospitals has motivated the reporting of NHS cost information with the intention of introducing external cost control:

The new performance framework will encourage greater benchmarking of performance in different areas, and the publication of comparative information will allow people to compare performance and share best practice... (Department of Health, UK, 1998:6).

The intention of this benchmarking initiative was to supply purchasers of health care services and NHS executives with tools “to tackle inefficiency and differential performance” (Northcott and Llewellyn, 2003) in order to put pressure on “inefficient” hospital trusts to reduce costs. As Northcott and Llewellyn stated, the benchmarking themes of measurement against a referent hospital, the opportunity of information sharing and, hence, continuous improvement were all present in the government rhetoric when the increased work on national benchmarking data in the UK was introduced.

However, some serious problems were associated with the fulfilment of the benchmarking ideas. First, were the problems in identifying where the benchmarking standards lay, because of failures to identify a standard of excellence or acceptable cost efficiency. Second, there

were large differences in the costing practices in hospitals that made the construction of cost indexes dependent on data with low robustness and thus created wrong specifications:

All of these difficulties negate the achievement of the central motives of benchmarking: continuous improvement, measurement against a referent other and rigour (Northcott and Llewellyn, 2003:63).

2.3 From indexes to cost drivers

Criticisms of the use of cost indexes and other financial measures have been raised also in the accounting literature, where it has been stated that the traditional management accounting systems have lost their relevance:

Today's management accounting information, driven by the procedures and cycle of organisation's financial reporting system, is too late, too aggregated and too distorted to be relevant for managers' planning and control decisions (Johnson and Kaplan, 1987:1).

In this context, there is a need for a study of cost indexes as performance measures in the hospital sector, to counter the lack of knowledge of the factors that drive costs behind the unit-cost indexes. The focus on cost causality is crucial, because the traditional costing systems fail to reveal the structures of the cost drivers (Cooper and Kaplan, 1988). This cost-driver perspective is of vital importance when cost indexes and other measures are analysed on hospital levels. The cost level of a hospital can be divided into costs related to various functions, specialities, or departments. Furthermore, costs depend on resource consumption arising from the severity of illness of the patients and the intensity of treatment, number of patient admissions, and number of examinations, tests and procedures undertaken in the treatment of patients.

All these stated cost elements should in principle be explicitly available in the information system if cost index information is to guide decisions and actions. The question is whether such information is available in the hospitals' management systems.

2.4 Interactive control mechanisms

Literature on strategic cost management focuses on different management control perspectives, where the diagnostic and the interactive perspectives are most relevant. In the *diagnostic perspective*, the focus is on the alternatives to control or programming of processes (Simons, 1995). From this perspective, budget and accounting information should be followed by performance evaluation schemes and Balanced Scorecards—systems that often are characterised as the main chain in the control system:

Diagnostic control systems are the formal information systems that managers use to monitor organisational outcomes and correct deviations from present standards of performance (Simons, 1995: 95).

Such systems are designed for motivation, control, and evaluation. The quality of such systems is dependent on the ability to tie performance (output) to the processes of service production, the availability of evaluation standards/indexes, and the possibility of active intervention when deviations are observed. In this context, the establishing of performance measures is important. As mentioned earlier, neither the cost indexes nor the creation of patient diagnosis-related groups (DRGs) are meeting these measurement criteria.

From the interactive control perspective, dialogue-based activity is the mechanism that ties together the formal and the informal elements in the control systems. We may believe that in contexts such as hospitals with a high degree of complexity, ambiguity, and change, dialogue and face-to-face communications will be vital as rich information media (Daft and Lengel, 1986). However, the dialogues should be based on relevant information:

Interactive control systems are formal information systems managers use to involve themselves regularly and personally in the decision activities of subordinates (Simons, 1996: 95).

The interactive control perspective focuses not on output as such, but on monitoring the organisational processes for the implications of decisions as the main consideration (rather than the data). Consequently, the discursive frame of the interactive perspective facilitates the decision processes at strategic levels, which presuppose active participation from managers at all levels. The management control system in Norwegian hospitals has focused on cost

measurement rather than cost management (Nyland, 2003). In the next part of the paper, we will discuss some major empirical characteristics of that management control system.

3. The empirical study

3.1 Introduction

Almost all hospitals in Norway are owned by the state, and the Norwegian hospital sector since 2002 has been divided into five large administrative regions. There are some 250 different health care institutions, from large hospitals to small outpatient units, which are organised into 40 local hospital enterprises. These enterprises are defined as autonomous administrative entities as to internal management systems and strategies. One of the main objects behind this reform was to make the hospital enterprises more accountable for their economic performance. Since 1997, Norwegian hospitals have been paid on a combined per-case payment and fixed-frames basis, where 60% of the total expenditure is based on budget frames. The revised payment system and the hospital enterprise reform are in line with the New Public Management reform concepts, as described previously.

The Norwegian hospital enterprise reform created new demands for management system structures, and the Norwegian Parliament decided that all hospital departments had to implement unitary management from 2002. The introduction of unitary management can be understood as implementation of one cornerstone idea of the New Public Management reforms, namely the realization of the performance management idea as a basis for governing public services. In order to establish performance management, managers must be given full accountability and autonomy to find ways to achieve objectives. In other words, the hospital department should be evaluated against its ability to reach a set of clear performance criteria and performance targets. This process is often referred to as devolution or decentralisation. Consequently, the tendency is to evaluate performance rather than relying on evaluation systems based on professional norms, rules, and specification of procedures.

Furthermore, a new law on patients' rights accompanied the hospital enterprise reform. This law implies that patients are given stronger legal rights, which—more or less—contribute to the patients being considered as customers.

Taken together, the different reforms mentioned here aim to establish organisational autonomy, to achieve transparency and professional management. As reforms, they move the public hospitals away from traditional public administrative systems of governance to more transparent and managed systems with an emphasis on the role of performance management. Seen a mere two years after the introduction of the hospital enterprise reform, transparency may be observed as the introduction of more detailed instruments to monitor performance and quality, accompanied by the patients' rights to be informed. The department managers are supposed to document better performance and results compared with many indicators on economic, medical, and clinical activities and indirect/direct quality measures.

The monitoring of economic performance in Norwegian hospitals is based on a national benchmarking database. Every year, the Ministry of Health works out performance indicators at all levels, including national data and data on the enterprise levels. However, the question is whether these data increase transparency in the hospital sector.

3.2 The organisation of the management control functions in Norwegian hospitals

In order to understand how management control activities were organised in the Norwegian hospital sector, a survey study was undertaken among the financial managers in the national population of hospitals. Among the 35 responding hospitals, the average number of employees in the management control function was counted as one employee per each 300 person-years in the hospitals. At that time (1999) the strategic and operational management control functions were centralised to the staff at the general manager's office.

These key respondents pointed to large deficiencies in the management control systems. The cost structure was perceived as complex, and every one of the 35 respondents said that it was impossible to calculate the cost of activities or cost-per-patient groups. This was contradictory to the fact that almost all the directors (84%) claimed this information to be very important for high quality control. Furthermore, calculation for decision making seldom took place, and the focus in the budget evaluation process was heavily on the cost side, whereas the income side was underestimated. In other words, the focus was on record keeping without attention on performance evaluation and feedback. Consequently, no action was taken to tie performance

measures to activity information, and thus accounting information was not used to guide decision making.

The financial managers in our study claimed that very few models of management control tools such as ABC, Balanced Scorecard, and so on were implemented in the hospital. Reasons given included these:

“Time is a bottle-neck, and we do not have the right competence.”

“We have too little resources for strategic planning—we have only time for keeping the wheels going”

“A general problem for hospitals is the fact that we need managerial generalists to keep going. Lack of time is then the problem.”

“To keep the wheels going” meant that the activity was focused on record keeping. Most managerial and accounting resources in the hospitals were occupied with cost reporting from clinical departments and aggregating these into cost reports at hospital level. This approach implied that management control for strategic purposes and planning was absent in the hospitals, and the knowledge about the connection between activity and cost was scarce. In an interview conducted in February 2004 with a financial director in one of the five regional health administrations, the informant concluded that this absence of management control for strategic purposes was still the situation after two years with the hospital enterprise reform.

These observations confirm the impression that information on cost is only aggregated and not decomposed to activity level or performance groups. This is in accordance with the criticisms in accounting literature stemming from the “relevant lost” discussion, and the observation that the focus on performance measures in general has been absent.

Accounting textbooks and the academic literature in accounting have, however, largely ignored the issue of productivity measures (Banker and Datar, 1987).

Aggregated productivity measures exist in Norway on a national benchmarking level. But as can be seen from the foregoing comments of financial managers in the survey study, they are not used for internal strategic purposes. In Norway, the national benchmarking data have been produced every year for the last 15–20 years. These performance indicators include measures on productivity, cost indexes, number of in-patients treated per hospital (and per hospital departments and specialities). The numbers of outpatient consultations are also presented. The

measures are presented at national and regional levels; however, their quality has been questioned. Criticism has been levelled at the aggregation problems, the failure to decompose the indicators into relevant units, and the complexity of tasks, which is not accounted for in the measures (Nyland and Bjørnenak, 2002).

Performance measurement indicators are based on the cost index, which shows the cost level relative to the average, corrected according to patient composition (diagnoses). The critical question is whether these indexes give relevant information. The study referred to earlier indicates that these indexes showing the relation between activity and cost are not used for strategic purposes in hospitals. If indexes are used for any information purposes, the focus is on cost per in-patient treatment —DRG-adjusted, i.e., according to patient diagnosis-related group (Fetter and Freeman, 1986), cost per in-patient day, number of patients per person (or doctor)-year and other efficiency rates. As can be seen from this short overview, the data information is very aggregated and standardised.

3.3 The case study

We have discussed several criticisms of the benchmarking data and performance measures within this field. The focus has especially been on the application of unit cost as a means of analysing the cost drivers behind rising costs in hospitals. A case study was conducted in 2001/2002 based on information from doctors on resource consumption. The study was undertaken in the surgical department of a large university hospital in Norway. The research question was whether high unit costs indicated unsuccessful management control in hospitals.

To understand and analyse the actual operation of management control systems, it is necessary to go beyond the descriptive accounts and to study how key decision makers understand and act under the system in practice. Consequently, it was decided to conduct a case study to go further into a complex system in practice (Yin, 1994). The research model was based on qualitative data, implying that our empirical information depended on the responses from members of the organisation. These members were key decision makers and their attitudes and knowledge gave input to a deeper understanding of the empirical setting. The answers and information of these key informants are vital data when studying managerial processes. By conducting interviews with key actors in the control processes, we were able to

understand and identify systems in practice. The data collection was based on semi-structured interviews. The interview guide was pre-tested before the final data collection. In order to obtain valid information, each construct was explained and discussed with the respondents during the interviews. The interviews were transcribed, and a summary of the transcriptions was sent to each respondent for comments and corrections.

Secondary data such as budget documents, activity data and data on patient records (anonymous) were used as supplementary information in order to gather relevant contextual knowledge about the hospital. However, the key informants provided most of the information used in this study. While this may have introduced elements of bias to the study, the inclusion of key informants as data sources is well recognised in the qualitative research literature (Rubin and Rubin, 1995).

The case study was introduced by presenting the doctors with the figures showing the development in the overall unit cost in the surgical department. After this introductory meeting, the chief clinician participated in selecting a representative number of informants to be included in the case study. Thirteen doctors agreed to be included, and they were each interviewed for an average length of approximately 90 minutes. The interviews were conducted in the doctors' offices. An interview guide was prepared beforehand and presented to the doctors during the interview. The questions were developed to discuss different kinds of complexity in the cost-driver perspective in order to analyse the following:

- Factors which could be associated with driving the resources used, dependent on the number of patients and the medical needs of individual patients
- Factors which could be associated with driving the resources used, and which were not dependent on the number of patients and the situations of individual patients

The surgical department in the University Hospital is one of the largest in Norway. In the department there are approximately 50 physicians and 7300 in-patients during a year. The managerial problem was—among others—defined as an increase in number of doctors without the same relative increase in activity. This department had experienced the same challenges as other hospitals in Norway, as the number of doctors employed in hospitals, had been rising in Norway during the last 5–10 years. The hospital activity and the number of patients treated had also increased, but at a lower rate than the increase in number of doctors. During the same time period, the unit cost had also increased, which is to say that the

efficiency also was reduced—substantially. However, the cost-driver perspective was completely absent in the discussions on this reduction of efficiency. This is contrary to the cost-driver perspective being a central concept in the strategic management control literature (Porter, 1985:63).

When analysing the available activity documents and reports in the department, it was observed that the services and outcomes in the surgical department were difficult to define; consequently, the resources consumed with each unit of outcome also were difficult to measure. Therefore, some indirect measures had to be defined. The most widely applied efficiency measure is the DRG-adjusted in-patient treatments, which implies that in-patient treatments are defined as outcomes. The constituent parts of the patient-related activities which comprise out-patient and day-patients are restructured into DRG-points which are meant to include all patient activities (Fetter and Freeman, 1986). These indicators were available as information in the surgical department.

The input measure used in this department is the number of doctor-years. This measure is very crude, because it is impossible to match with the mix of services and activities that are made. The measure is calculated as number of doctors employed multiplied by the number of planned working hours a year—not the number of actual hours worked. It does not include overtime, which is an element believed to be substantial in the actual number of hours performed. Furthermore, it was observed that the doctors' activities in the department were very interrelated with the activities of other professional groups (mainly nurses) and interrelated with the use of medical-technical equipment and innovations. Consequently, the measuring of doctor-years as proxy input measures do not include all the relevant and interrelated activities. Despite all the crudeness inherent in the outcome-measures and activity measures discussed in this paper, they are widely used as indicators of development in unit costs.

Figure 1 about here

Fig. 1. Unit cost defined as wage expenditures per DRG-point, 1993–2000²

² When the DRG-indexes are calculated, it is important that the same reference model for the calculations is used. Changes in the treatment practices and technological innovations may be expected to affect the efficiency measures. However, these changes are supposed not to be included here.

Figure 1 shows that there is a heavy increase in the unit cost by 44% in the period 1995–98. During this period, wages increased substantially, and a large part of these increases in unit cost was caused by this price-effect. These increases in unit costs are externally imposed, and they should in principle be extracted from the evaluation of the development of the department efficiency. However, unit costs may also be affected by internal department decisions such as the mix in use of doctor resources in the department. One method to isolate the effect of changes in unit cost is to use number of doctor-years as a measure of resources.

Figure 2 about here

Fig. 2. Number of doctor-years per 1000 DRG points, 1992–2000³

From Figure 2 we can observe that the unit cost increased by 24% from 1992 to 1997, and the increase during the whole period was 14%. In this way, we can illustrate the use of doctor resources combined with volume/activity. However, the effects of non-volume factors are still present in the unit cost. The information in Figure 1 is still a mixture of different effects made by volume, productivity, and measurement biases due to the conceptual problems inherent in the definition of activity numbers and resource consumption.

Another proxy measure of productivity is the number of DRG-points per employed doctor per year. According to the hospital manager, this is a performance measure used in the management control of the hospital. Figure 3 shows the number of DRG-points per doctor and the number of doctors employed in the department during the period 1992–2000.

³ Changes in number of hours per doctor-year due to changes in the contracts between the employer and the employees, extra hours worked, and so on are not included. This makes the numbers somewhat more misleading.

Figure 3 about here

Fig. 3 Number of DRG-points per employed doctor and number of doctors in the department, 1992–2000

In general, most of the key informants pointed to the fact that these performance measures (DRG-points) were highly ambiguous and not “real” measures. When the hospital payment system was changed in 1997 from basically fixed-frame budgets to prospective per-case payment based on DRG-unit prices, the key informants interviewed said that this change increased the focus on the coding of diagnoses and procedures, which in turn produced a strategic increase in the number of DRG-points. These informants with close interaction with the world of clinical reality interpreted the increase in DRG-points per employed doctor in the department from 1997 as a strategic adaptation and not a real increase in activity.

Other important trends (which the output measure does not account for) are the observations that the population of patients is growing older and therefore more demanding of resources:

We have got very old patients and the tendency is towards ever older and more demanding (due to severity of illness) patients. These patients stay longer in the hospitals and consequently, the capacity for other patients' decreases. The illnesses are getting more complex, with problems from heart, lungs and circulation deceases. This implies that we must cooperate and coordinate with other specialities ...
(Surgeon in the department).

As can be observed from this statement, more complex diseases are now registered with more frequent comorbidity among patients. Complexity of diseases increases with age, as older patients have more comorbidity diseases in heart, lung, and other organ systems.

The presence of more demanding patients is partly caused by the great technological innovations made in surgical specialities during the last 10 years. This is especially true for the use of laparoscopic surgery and invasive techniques:

We are now treating patients who earlier did not get any treatment such as patients with cancer spreading to the liver This reduces the capacity to treat patients with less complex diagnoses.

As the degree of specialisation increases, both the patients and the doctors will work towards higher levels of competence and complexity.... (Surgeon in the department).

Technological development causes changes in efficiency in different ways. Sometimes, these changes will imply less resource-demanding procedures (e.g., laparoscopic surgery).

However, this is in fact very seldom the case:

Technically complex procedures need more doctors in order to supply high quality services. The procedures are technically more demanding, the learning processes are slower and many doctors will – on the average – need training and education. This will in turn imply duplication of doctors. Of course, this will cause high quality treatments, but not necessarily shorter stays and reduced costs... (Assistant surgeon in the department).

Another tendency is the fact that the most highly specialised hospitals, due to this specialisation, receive patients from other hospitals:

No doubt that other hospitals transfer the most seriously ill patients to us... and thus, they keep the cheaper(and more profitable) patients themselves. As soon as there is comprehensive intensive care treatments involved, patients are sent to us.... (Surgeon in the department).

This kind of “patient shuffling” has been widely debated as a possible consequence of the DRG-based payment system to hospitals (Ellis, 1998).

Costs and efficiency in hospitals are also affected by factors other than technological innovation and patients’ diagnoses. Some of these factors are related to cultural and traditional practices, such as the tradition that doctors work without payment when they are technically off-duty. This is a cultural factor, which has changed during the period, and this trend has in fact reduced the number of working hours:

In my career as doctor here since 1983... I now notice that the assistant doctors consequently leave the hospital when they are off-duty in the mornings even when

there might be very interesting challenges in the operating theatre. Leisure time is now given higher priority than the career ... (Chief surgeon in the department).

I do very little work which is not directly paid by the employer... (Assistant surgeon in the department).

Over the last 10 years, the department has been split into six different sections, an outcome mainly driven by technological development and the demand for highly specialised services. The direct cost accompanying this sectioning might not be high, but the indirect costs are estimated to be relatively high. Due to on-call services in every section, the number of doctors has increased far more than the relative increase in patient volume in these sections:

The patient volume has been relatively stable here. So, in your way of measuring this, we are now more specialists treating the same amount of patients... (Chief surgeon in the department).

In order to make the system of working-plans to fit together, we need more doctors – but they are here less at the day time – due to the continuous work day and night... (Assistant surgeon in the department).

In this hospital there are other functions present such as research activities and the education and training of doctors. The number of students has increased significantly in recent years. Most clinical education is done in close contact with patients in the clinic, and this structural contingency can result in that the number of doctors being almost doubled during periods with educational activities. Figure 3 shows that the number of doctors increased by 60% over the whole period. Since the efficiency measure does not include research and education, increased activity within these fields is causing efficiency to decrease. One informant has experienced change in this way:

These days it happens that we can do clinical research work during ordinary working days. This was completely impossible in the earlier days... (Surgeon in the department).

However, this picture is not quite homogeneous. The increased number of doctors is also driving resource consumption through increased complexity:

The more people we are here, the more complex is the activity... (Surgeon in the department).

There are now so many different hierarchies to cooperate and communicate with...it takes too much time... (Surgeon in the department).

Now we have different specialists for every part of the body. This means that the patients must be administered through different doctors and specialities, and this is very time-consuming. Such quality implies higher costs” (Assistant surgeon in the department).

In general, the doctors are less accessible to patients in the daytime, and consequently, several different doctors have to get information on the same patient and spend time to understand and communicate their information, which in turn also reduces the continuity in the treatment chain. As the number of doctors having clinical responsibility for a patient increases, the need for documentation and paperwork increases:

“Reduced throughput of patients is not a problem of resources, but an organisational problem. A patient may during his/her stay meet 5-6 different doctors; one at the outpatient unit, one who prepares for the operation. Another who performs the procedures in the operating theatre, one doctor who takes care of the patient when he/she leaves, and finally, the clinical manager of the department very often looks through all the patient administrative papers after the patient has left. Thus, a lot of resources are consumed which are not directly connected to the treatment itself...” (Chief surgeon in the department).

To summarise the foregoing discussion, there are indications that increased unit costs do not necessarily imply lower productivity and unsuccessful management control. The reason is to be found in the very crude measures of input and output. As a synthesis, we may say that increased specialisation, sectioning of departments, and complexity in the production of services have increased the tasks of coordination vertically and horizontally in the hospital. These structural changes will affect unit costs, and consequently, unit costs will not give a true picture of the performance level and management control activities.

In order to understand what drives the increase in hospital unit costs, it is necessary to decompose the different factors related to patient needs and the services offered by the hospital. This implies that there are costs related to the patients' resource consumption and costs related to more function-related resource consumption. The traditional focus on aggregated information based on activity volume and number of patients produces low-quality information that in turn does not support the clinical and administrative management in their strategic and operational decisions.

4. Discussion

4.1 Introduction

The introduction of the new management practices in the hospital sector has been discussed with the focus on the introduction of private sector management techniques such as performance measurement and performance audit schemes. The research question was to investigate the application of performance measures in decision making. A national survey study and a case study in a surgical department at a large university hospital were undertaken in order to study the systems in action.

4.2 Measurement biases

There are obvious weaknesses associated with performance measures in hospitals. These apply mainly to the fact that the activities that are not directly included in the treatment of patients such as the education and training of professional staff, capacity invested in on-call services, and research activities, are not included in the performance concept. In a surgical department there are many different performance measures like surgical procedures, number of patient treatments, research activities, education activities, and on-call services related to emergency situations. The choice of the number of DRG-adjusted treatments as a performance measure indicates that most of the other measures mentioned are not included in the statistics.

The main reason for these measurement problems is that surgical services—as with most health care services—are integrated production processes where resource usage is not separable into clearly defined elements. Consequently, the input measure (cost) most often

includes total resource usage, while the output measures only account for part of the total range of activity. Furthermore, these measurement biases are not constant over time. In general, performance measures which are crude, aggregated, and inflicted with mismatched information are of very little practical use as performance measures, because they invite strategic action in the form of sub-optimisation, but give little causal information to guide actions through interactive control (Simons, 1995).

4.3 Complexity and the role of accounting information

The financial directors in the nationwide survey study confirmed without exception that there were large deficiencies in the hospitals' management control systems. The focus has been—and still is—on cost reporting and cost control. Consequently the use of accounting information in strategic planning is absent. Although this information was gathered before the large hospital enterprise reform in Norway in 2002, key respondents admitted that this was also the situation after the reform.

Furthermore, there is little knowledge on the connection between activities in the hospital and the cost drivers, especially as cost information is not decomposed into relevant cost drivers. There are also obvious weaknesses attached to the national benchmarking data that are based on cost, including unit costs associated with the diagnosis-adjusted in-patient treatments (DRGs). First, there are the technical problems inherent in the make-up of the statistics on patients and patient groups. Second, the cost indexes and unit-cost concept are too aggregated to give relevant information for diagnostic management action and interactive management control processes (Simons, 1995).

The case study in the surgical department illustrated the managerial problems associated with the measuring of input and output in order to analyse why expenditures were rising substantially during several years. The study illustrated the process of decomposing information in order to understand why unit costs, defined as wage expenditures per DRG-point for 1993–2000 were rising. The study showed that the costing had to consider the number of doctor-years per 1000 DRG-points for 1992–2000, the number of DRG-points per employed doctor, and number of doctors in the department for 1992–2000 in order to develop indicators that had relevance for decision making. The documentation revealed that measurement errors in unit costs existed because input measures included total resource

consumption, while output measures only comprised the number of patients treated. This is to say that the information was not decomposed into relevant elements, and the measures did not add transparency to the organisation.

4.4 The lack of diagnostic and interactive control

Another main finding was that the cost per patient treated in the hospital did not provide an adequate performance measure that could give relevant information for strategic decisions. Although the clinical managers in the surgical department in the large hospital over a long period had observed rising unit costs, no diagnostic actions were taken. The discussions were mainly focused on reasons and excuses for the rising costs, and very few questions were raised as to developing alternative strategies.

This lack of diagnostic action may be due to the measurement problems, as the existing performance measures did not give transparency upon which control action could be based. When information is too aggregated and includes too much irrelevant information or is missing relevant information, interactive control procedures also will be hampered. Consequently, the motives behind the introduction of performance measures—learning and improvement through monitoring—are more rhetorical and symbolic than observable in practice.

4.5 Implications and future research

This research has been based on three sources of data that gave insight into the fact that accounting information was mostly used for recording and historical purposes, and that there was very little diagnostic action based on this information. Furthermore, large measurement biases were found in the performance measures. The widely used performance measure defined as unit cost per patient treated was very crude due to measurement problems both in the input and the output measures. Consequently, these measures did not facilitate strategic and operational decisions. This effect in turn implied that transparency was not added to the hospitals' resource utilisation or production processes.

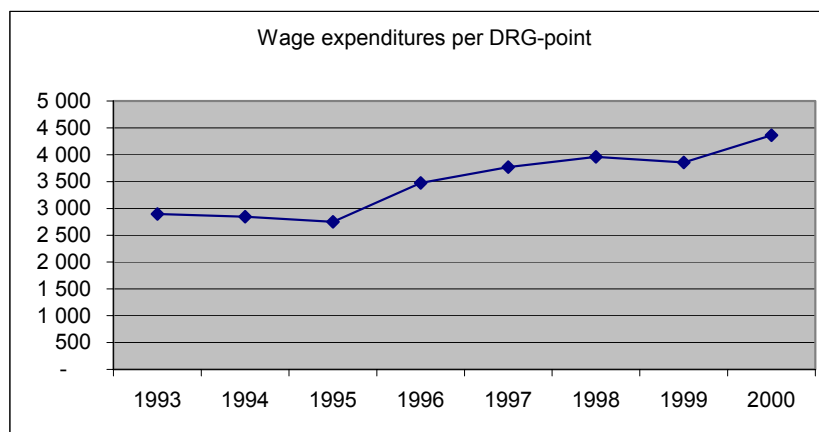
This lack of transparency is illustrated in the fact that there had been increasing unit costs per treated patient in the hospital department for many years, but no diagnostic actions were

observed. One reason might be that it was difficult to analyse from the data why unit costs were rising, whether this was due to technological changes, changes in the mix of production, or changes in efficiency rates. In fact, the data on unit cost created frustration, confusion, and did not act as incentives for learning or improvement.

It should be noted that these data give a picture of the situation in a surgical department as a particular context, and the findings can therefore only to a limited extent be generalised. If the study were to be repeated in departments with other medical specialities, new insight might be given as to the adjustments hospitals make in times of changing management control systems.

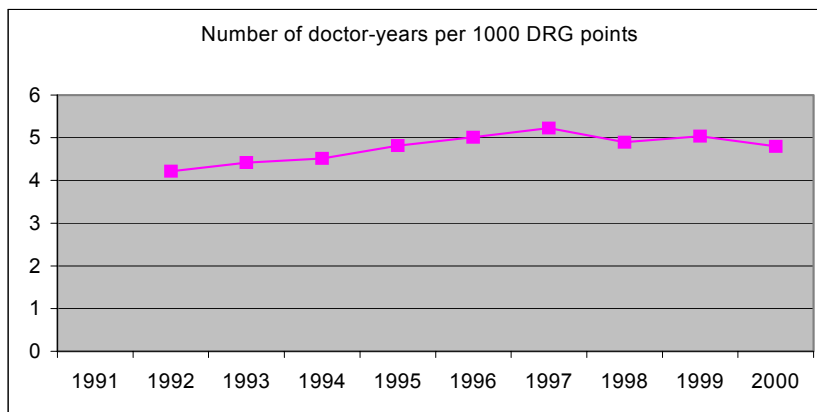
However, the analyses add to our knowledge on how performance measures are used in hospital settings. Future research will benefit from going deeper into the questions on the cost-driver perspectives and the complexity of health care services that should be understood in order to develop practical indicators for interactive control purposes.

Fig. 1. Unit cost defined as wage expenditures per DRG-point, 1993-2000⁴



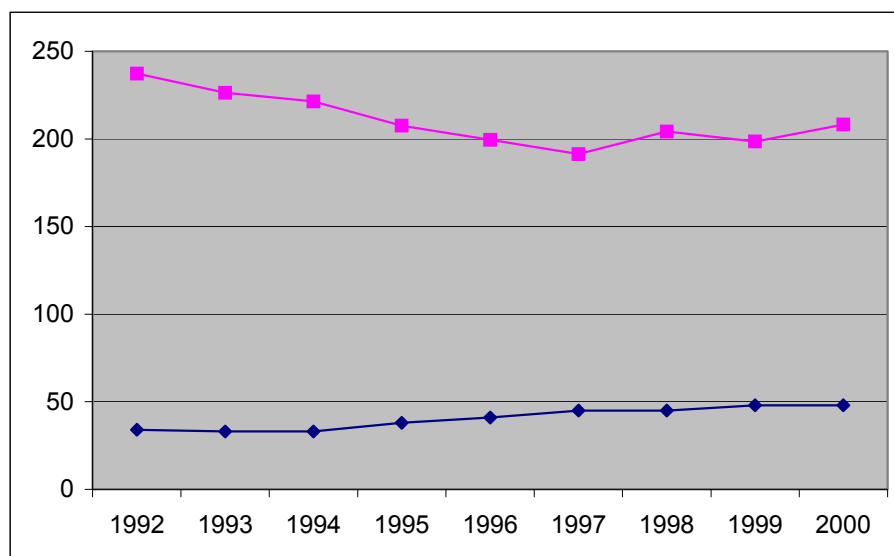
⁴ When the DRG-indexes are calculated, it is important that the same reference model for the calculations is used. Changes in the treatment practices and technological innovations may be expected to affect the efficiency measures. However, these changes are supposed not to be included here.

Fig. 2. Number of doctor-years per 1000 DRG points, 1992–2000⁵



⁵ Changes in number of hours per doctor-year due to changes in the contracts between the employer and the employees, extra hours worked and so on are not included, which make the numbers somewhat more misleading...

Fig. 3. Number of DRG-points per employed doctor (1) and number of doctors in the department (2), 1992–2000.



References

- Broadbent, J., 1992. Change in organisations: A case study of the use of accounting information in the NHS. *British Accounting Review*, 24, 343-367.
- Bromwich, M., Lapsley, I., 1997. Decentralization and management accounting in central government: recycling ideas? *Financial Accountability and Management*, 13 (2), May, 181-201.
- Brunsson, N., 1989. *The Organization of Hypocrisy, Talk, Decisions and Actions in Organizations*. Wiley, Chichester, UK.
- Brunsson, N., Olsen, J., 1993. *The Reforming Organisation*. Routledge.
- Cavoleski, M., Dirsmith, M., Michelman, J., 1993. An institutional theory perspective on the DRG framework, case-mix accounting systems and health-care organisations. *Accounting, Organizations and Society*, 65-70.
- Daft, R.L., Lengel, R.H., 1986. Organizational information requirements, media richness and structural design. *Management Science*, Vol.32, No.5, 554-571.
- Ellis, B.R., 1998. Creaming, skimping and dumping: Provider competition on the intensive and extensive margins. *Journal of Health Economics*, 17, 537-555.
- Fetter, R.B., Freeman, J.L., 1986. Diagnosis related groups: product line management within hospitals. *The Academy of Management Review*, No. 11, 41-45.
- Governmental Note No. 44, 1995-96. "The waiting list guarantee – criteria and financing", Norwegian Government, Oslo.
- Government Proposal to the Parliament, No. 47, 1999-2000. "About hospital economy and budget 2000", Norwegian Government, Oslo.
- Hood, C., 1995. The New Public Management in the 1980's: variation on a theme. *Accounting, Organisation and Society*, Vol. 20, No 2/3, 93-100.
- Hood, C., 2002. The risk game and the blame game. *Government and Opposition*, 37 (1), 15-37.
- Hopwood, A.G., Miller, P. 1994. *Accounting as Social and Institutional Practice*. Cambridge Studies on Management.
- Jones, C.S., Dewing, I.P., 1997. The attitudes of NHS clinicians and medical managers towards changes in accounting controls. *Financial Accountability and Management*, Vol. 13, 261-280.

- Kurunmaki, L., Lapsley, I., Melia, K., 2003. Accountingization v. legitimation: a comparative study of the use of accounting information in intensive care. *Management Accounting Research*, 14, 112-139.
- Lapsley, I., 1994. Responsibility accounting revived? Market reforms and budgetary control in health care. *Management Accounting Research*, Vol. 5(3,4), 337-352.
- Lapsley, I., 2001. Accounting, modernity and health care policy. *Financial Accountability and Management*, 17 (4), 331-350.
- Law on Hospital Trusts, Ot.prp. no 66, 2000-2001, The Norwegian Government, Oslo.
- Meyer, J.W., Rowan, B., 1977. Institutionalized organizations: formal structure as myth and ceremony. *American Journal of Sociology*, Vol. 83, pp. 21-44.
- Meyer, J., Scott, W.R., 1992. *Organisational Environments: Ritual and Rationality*. Sage, London.
- Modell, S., 2001. Performance measurement and institutional processes: a study of managerial responses to public sector reform. *Management Accounting Research*, Vol. 12, 437-464.
- Modell, S., Lee, A., 2001. Decentralisation and the reliance on the controllability principle in the public sector. *Financial Accountability and Management*, 17 (3), 191-218.
- Northcott, D., Llewellyn, S., 2003. The "ladder of success" in healthcare: the UK national reference costing index". *Management Accounting Research*, 14, 51-66.
- Nyland, K., 2003. *Systemenes relevans i norske sykehus*. Avhandling for graden dr.oekon, Norges Handelshøyskole, Bergen.
- Nyland, K., Bjørnenak, T., 2002. The economics of complexity: dimensions, effects and financing. Paper at the AREHCAS Final Symposium, Venice, March.
- Nyland, K., Pettersen, I.J., 2004. The control gap: the role of budgets, accounting information and (non-) decisions in hospital settings. *Financial Accountability and Management*, 20(1), 77-102.
- Pettersen, I.J., 1995. Budgetary control of hospitals: Ritual rhetorics and rationalized myths? *Financial Accountability and Management*, 11 (3), 207-222.
- Pettersen, I.J., 2001. Hesitation and rapid action: the New Public Management reforms in the Norwegian hospital sector. *Scandinavian Journal of Management*, 17, 19-39.
- Power, M., Laughlin, M.R., 1992. Critical theory and accounting. In: Alveson, M., Wilmott, H. (Eds.), *Critical Theory and Accounting*. Sage, London, 113-135.

- Roberts, J., Scapens, R., 1985. Accounting systems and systems for accountability: understanding accounting practices in their organisational contexts. *Accounting, Organisations and Society*, Vol 10, No. 4: 443-456.
- Rubin, H., Rubin, I., 1995. *Qualitative Interviewing: The Art of Hearing Data*. Thousand Oaks, CA: Sage.
- Simons, R., 1995. *Levers of control: how managers use innovative control systems to drive strategic renewal*. Harvard Business School Press, Boston.
- Weick, K., 1976. Educational organisations as loosely-coupled systems. *Admin. Sci. Quart.*, 1-19.
- Yin, R.K., 1994. *Case Study Research: Design and Methods*. Thousand Oaks, CA: Sage.